Notes July 19, 2007
Nutrient Science Advisors
257 Science Hall

Participants: Tom Wilton, Joe Larscheid, Mike Quist, John Olson, Ed Brown, Chris Jones, John Downing, John Reyna, Mike Burkart, and Bill Ehm.

Observers: Tom Oswald (NRCS), Connie Dou (DNR), Adam Schnieders (DNR), Anita Maher Lewis Steve Schoenebaum, and Chris Gruenhagen (Farm Bureau).

The meeting started at 10:00 AM

Bill Ehm reported that the blog/forum could remain open to members of the NSA group only without violating open-meetings laws as long as it is not used for the purposes of deliberation and action. This will allow us to post publications for only the group's use without abusing copyrights and facilitate a more open discussion of ideas and opinions before formulating reports.

Review June 26 action items related to transparency and chlorophyll-a criteria:

Joe Larscheid presented a break-point analysis (2-D Kolmogorov-Smirnov test) of Iowa lake secchi measurements, chl-a, and TP for individual years 2000-2006 and all years combined. Break-point analysis shows the values of two variables at which the relationship changes. This analysis showed that:
-- at an average break point of 1.2 m secchi depth, Chl-a had an average of 22.6 µg/L. When Chl-a exceeded this value, the secchi depth seldom was greater than 1.2 m.
-- This will provide supporting evidence for a transparency criterion of 1.2 m Secchi depth.

A similar analysis of secchi depth and TP showed:
-- at an average break point of 0.90 m secchi depth, TP had an average value of 76.05 µg/L, thus transparency of 0.9 m can be consistently maintained in waters with no more than 76 µg/L TP.

A direct correlation between TP and Chl-a provided reasonable R^2 only with second order equations.

Discussion about whether to use the arithmetic mean or median concluded that the median provided more information about the central tendency of skewed data such as these.

Tom Wilton provided statements and a reference for the Boy Scouts of America recommendation of 3 ft visibility for surface swimming (upper 12 inches) and 8 ft. for diving, etc.

Tom Wilton, Pete Weyer, and Ed Bottei found that low transparency was mentioned in accidents resulting in injury and drawings. However, no clear relationship was found in Health Dept. reports or literature to link a specific transparency measure to such incidents.

Tom Wilton also found that the World Health Organization (WHO) recommendations on lake turbidity were not specific.

John Olson, found that the Ontario reference to .7 m secchi depth as cited in the MN lakes study could not be tied to a citable scientific study.

John Downing reported on a preliminary analysis of data from the ISU/CARD survey of lake visitors. He will analyze the data and relate it to secchi depth and perhaps other variables with some guidance. Discussion led to recommendations to:
-- determine/calculate probability that people would rank each lake with an EPA water-quality ladder value of ≥ 6 (suitable for swimming).
-- weight the probability by the number of respondents
-- correlate this with the average secchi depth and TP for: 2003 measurements—the year of the survey — and 2001-2003 values – the years of record before and during the survey year.

John Downing presented a probability graph of Chl-a exceeding 10, 20, 30, and 40 μg/L. **Joe Larscheid and John Downing** will work together to produce a similar analysis of Chl-a and TP.

We agreed to provide a brief narrative behind each line of evidence with references that support both the narrative and specific values of transparency and Chl-a.

We will also define the TP that relates to the consensus values of transparency and Chl-a.

Discussions of draft recommendations for transparency and chlorophyll-a:

Mike Burkart distributed drafts of text and some illustrations justifying concensus criterion for each of these variables.

Most discussion focused on how to describe the frequency of measurements and duration of threshold exceedence needed to determine if it a lake met the criterion.   A consensus was reached that this was an issue related to implementation and could not be clearly defined using only scientific analysis. Available funding for measurements and policy decisions would be important in determining the number and frequency of measurements. This group will deal with the threshold quantity and the probability (or frequency) of exceeding Chl-a and reduced transparency.

Rather than discuss specific language as a group, we agreed to review the draft recommendations that Mike will post on the forum and reply with specific

recommendations for additional or modified language, cited references, and graphs before the next meeting. Mike will assemble the comments into another draft.

Review Cyanobacteria toxicity information:

Mike Burkart presented a summary of information provided by **Ed Bottei, Pete Weyer,** and WHO recommendations on Cyanobacteria, cyanotoxins, and microcystins. While there appear to be clearly identifiable criteria for ingestion toxicity, it was decided to use these constituents to support a Chl-a criterion. Aldo, it was noted that microcystins were not the only, and perhaps not the most toxic of cyanotoxins.

Discuss aquatic life definitions and descriptions

Mike Burkart reported that he had met with **Dick Baker, Mike Birmingham** and Todd Hubbard about pre-settlement information on aquatic organisms. Dick explained that he had worked more on Iowa rivers, although he knew of research on Midwestern lakes and thought it was possible to draw inferences about natural aquatic life using indicator organisms or measures of diversity that could be linked to nutrient levels. They thought that more information was available in Iowa about rivers than lakes. There have been several studies of diatoms in sediments and these are useful for characterizing paleoecological conditions.

Other comments include:
-- It will be difficult to characterize aquatic life in constructed lakes.
-- We should seek to characterize communities
-- Links to nutrients may take more study and data collection in Iowa.
-- **John Downing** currently has a student collecting data on diatoms in 35 Iowa lakes and expects to be able to ultimately develop a lake transfer function to define nutrient concentrations.
-- This would be a useful tool to develop a tiered system for classifying lakes by aquatic life.
-- **John Downing** suggested that zooplankton would also be useful.
-- We are probably at least 2 years away from developing an IBI for lakes.
-- **Joe Larscheid** agreed to characterize the non-continuous change from maqcrophyte-dominated to phytoplankton-dominated lake systems.

Review of action items and future meeting schedule.

-- **John Downing and Joe Larscheid** will provide probability analysis of Chl-a and TP.

-- **Joe Larscheid** will provide text and graph(s) summarizing the break-point analysis to support both transparency and Chl-a criteria.

-- **All** will review and edit draft recommendations and reply to the forum. If these are completed by August 6, Mike can incorporate comments into a second draft.

Next meetings will be August 9 and September 12 10 am to 4 pm. The location in Ames to be announced.

The meeting ended at 4:00 PM